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## **EVALUATION GUIDELINES FOR TRAINING IN WATER AND SANITATION**

WASH Technical Report No. 70

April 1991



**WATER AND SANITATION  
FOR HEALTH PROJECT**

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GTZ-Deutsche Gesellschaft für Technische  
Zusammenarbeit (GTZ) GmbH

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Although the authors are those who had the most extensive involvement in the writing of the document, others made valuable contributions in both its development and its field testing. The original team consisted of Lee Jennings, WASH consultant; Christina Van Wijk of the International Reference Center for Water and Sanitation; and John Kalbermatten, GTZ consultant. This team conceptualized the approach taken in the document. The first draft was largely written by Lee Jennings.

The first draft was subsequently revised by Richard Middleton, GTZ consultant, who added many of the examples found in the final version. After a review of the second draft by WASH and GTZ, Steve Joyce, WASH consultant, substantially revised the document to its current form and helped make it a very readable product. Hortense Dicker, WASH consultant, and Norma Sanchez de Lanz, GTZ consultant, field tested this draft in SANAA in Honduras as part of the regional technical cooperation project "Promotion of CAPRE-ANDESAPA" supported by GTZ and PAHO/CEPIS. The project will prepare a Spanish translation of the document. Both consultants provided valuable input into the final draft. Steve Joyce made the final revisions and incorporated the results of the field test. Lynda Edwards did an excellent job editing the final draft. Finally, Fred Rosensweig of WASH and Klaus Kresse of GTZ collaborated closely in managing this effort.

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## EXECUTIVE SUMMARY

Evaluation of training is essential. Not only does it help to assure that training addresses priority problems in the most appropriate ways, it also helps to assure that future events are better designed and implemented. This document introduces a six-stage training evaluation model:

- Training needs and goals (Stage 1)
- Training design (Stage 2)
- Training delivery (Stage 3)
- Immediate training results (Stage 4)
- Training application (Stage 5)
- Training benefits (Stage 6)

It is not always necessary or appropriate to evaluate all six stages of the training evaluation process. Although this document discusses all six, stages 5 and 6 are its primary focus.

Stage 5, *Training Application*, determines the extent to which skills acquired in a training program are being "transferred" to the job. It is concerned with what happened as a *result* of the training, and not with whether the training program achieved its immediate learning objectives. Thus, the workplace is usually the domain of a Stage 5 evaluation.

Stage 6, *Training Benefits*, identifies and measures the benefits from a training activity. Stage 5 shows that training graduates are applying the skills they learned to the job. Stage 6 may find that the condition the training was designed to address remains a problem, even as this document also includes suggestions for planning and organizing a training evaluation.

## Chapter 1

# BACKGROUND AND SCOPE OF THE GUIDELINES

## 1.1 Background

This document focuses on training; however, references are also made to the other important human resources development (HRD) functions, since they affect training. HRD, as defined by the World Health Organization (WHO), consists of three interrelated functions: planning, training, and management. A wide range of organizational strategies and activities are related to one or more of these three functions, including education and training; recruiting, hiring, and promotion policies; supervision and management; benefits; HRD planning; and occupational welfare.

Human resources development has received increased attention in recent years within the water supply and sanitation sector. There is now ample evidence of the impact that HRD activities—particularly training—can have on providing and maintaining water supply and sanitation services.

### 1.1.1 Why Training Evaluation Is Essential

HRD activities are usually undertaken when management decides that some part of the organization's operations needs improvement. Unfortunately, these efforts are sometimes poorly or wrongly conceived and thus produce inadequate results, do not prove cost effective, or fail altogether. For example, a training program directed at employees at the operational level may be an inappropriate HRD solution. The employees' unproductive work and low morale may be due not to lack of skills, but rather to the poor management practices of their supervisors. Additional training of operational-level staff will not have the desired effect in the organization until managers are also trained or a more-supportive environment for good management develops.

In many situations, HRD activities are not the solution to the problem. If an organization is adopting inappropriate or unaffordable technologies, no amount of staff training will improve the situation until the fundamental strategy defects are addressed.

These examples illustrate why evaluation of training and other HRD activities is essential. The process of evaluation—whether carried out at midpoint or completion—helps reassess whether the problems were correctly defined and the solutions were appropriately identified. It also helps identify lessons learned that can be applied to future training programs.

### 1.1.2 Training Evaluation and Managers

Most managers don't understand training. They don't know when training is the appropriate solution to an organizational problem and when it is not. They often see training as the best way to address performance problems. They also often see training as informational in

purpose and assume that giving participants information—through lectures, books, handouts—will result in the desired behavioral changes.

Training can be a valuable organizational-improvement tool for managers, but they must first understand how to use it. If evaluation is included as an integral component of the training cycle, managers can better understand how to use training as a fundamental element of their management function.

## **1.2 Purpose of these Guidelines**

This document provides a systematic "how to" approach for evaluating the effectiveness of training activities in the water supply and sanitation sector. The guidelines primarily focus on training results: how to evaluate skills gained in a training program and how to evaluate the *impact* of those skills in the workplace. The ultimate purpose of the guidelines is to improve and sustain water and sanitation services. As noted, this document primarily focuses on one HRD function: training. As an evaluation tool, it will contribute to the water supply and sanitation sector in three specific ways. It will—

- Help ensure that scarce resources are effectively deployed to deal with priority problems.
- Contribute to better designed and implemented training activities.
- Contribute to other aspects of institutional upgrading that are essential for improving the delivery of sector services.

The guidelines are not meant to be prescriptive. They do not, for example, specify generic indicators that should be used in evaluating all training activities. Because training can cover a wide range of skills and disciplines, a wide variety of indicators may be found appropriate or useful. Such indicators should be established during the developmental phase of each training activity.

## **1.3 Application of the Guidelines**

There are a variety of potential users for this document, including both external and internal evaluators and managers of training efforts at various levels in the water supply and sanitation sector.

### **Government**

- National—Policy and Senior Management Staff
- Regional—Supervisory/Midlevel Management Staff
- District—Supervisory/Executing Staff

## External Agency

- Sector Specialists and Program Planners

### 1.3.1 Evaluating Training Application and Benefits

These guidelines will help users evaluate how training participants apply skills and knowledge in their workplace, and also how the skills applied affect the work unit or the organization. In determining the effectiveness of a training activity, four factors need to be measured:

- **Reaction.** How well did the participants like the program or activity?
- **Learning.** What skills, knowledge, and attitudes did they learn?
- **Behavior.** How did their individual job performances change as a result of the training?
- **Results.** What tangible results did the program bring about in terms of improved organizational performance?

These guidelines focus primarily on the last three: learning, behavior, and results. Particular attention is given to the last two, however, since they focus more on the long-term impact of training, that is, the application of what has been learned and the achievement of ultimate benefits.

It is hoped that users of the guidelines will address questions such as these:

- Did participants learn what the training goals said they would learn?
- In what ways could the application of skills learned in training have been enhanced?
- Were people trained for the skills, knowledge, and attitudes that they actually needed to perform their jobs?
- How could the training activity have been improved?
- How well was the training activity planned and managed?
- Was the problem correctly identified in the first place?
- Was training the appropriate response to solve the identified problem?
- Did the application of these new or enhanced skills improve organizational results?

- Did training improve trainees' motivation to perform better and improve their skills?

Evaluation of completed activities is most useful when considering a continuation of the activity to a further phase, or its extension to other agencies and project areas. Evaluation can also take place at the midpoint of a training program, when there is still time to modify it. Such timing is especially useful in innovative programs. In addition to evaluation of a specific program, the information generated from the listed questions will prove valuable when designing future training or other HRD activities.

### **1.3.2 Optimal Evaluation Conditions**

Under the best conditions, evaluators have access to good documentation and to the right people. Following is a list of conditions that should be present.

- Well-maintained training program documentation—training plans, participant lists, instructor manuals, course handouts and other training materials, and interim and final reports
- Trained people
- People with institutional memory, who—
  - Helped conceptualize the training program
  - Can describe the outcomes that were expected
  - Selected the participants
  - Supervised the returned participants in the workplace

Moreover, the training unit should have conducted some follow-up activities to determine or assess the training benefits.

### **1.3.3 Minimal Evaluation Conditions**

In many situations, the reality offers far less than the best evaluation conditions. Training implementation may have been haphazard and of low institutional priority. There may be limited understanding that evaluation and follow-up are integral aspects of the training cycle. Effective evaluation may be seen as a cost, rather than as an investment, or training departments may have a very limited understanding of what is involved in evaluation, and therefore lack training documentation. In these situations, the guidelines in this document could present an inordinate challenge to evaluators.

For these guidelines to be useful as an evaluation tool, two minimal conditions should exist:

1. Some documentation is available for each step of the training process.

2. Some people with first-hand knowledge of the program (program coordinators, trainers, participants, supervisors) are available to be interviewed.

When the field reality is much closer to the minimal evaluation conditions just cited, these guidelines can serve as a learning tool: they can provide training units with a complete evaluation framework, and they can help the units set new training standards.

#### **1.3.4 Other Uses**

The evaluation framework in these guidelines should also prove helpful in ways other than assessing the effectiveness of specific training programs. For example, it can help the user—

- Evaluate the soundness and effectiveness of a national-level training plan for the water supply and sanitation sector.
- Assess the effectiveness of an effort to strengthen training institutions that prepare personnel for the sector.
- Monitor national or project training activities.
- Discuss the training aspects of institutional strengthening with decision makers in water and sanitation institutions.
- Provide information on the effects training efforts have had on various groups—ranging from village water or health committees to national action committees and national-level program management bodies.

## Chapter 2

# A TRAINING EVALUATION MODEL

### 2.1 Introduction

This chapter introduces a six-stage training evaluation model. Before doing so, however, some key elements of training are first discussed, including six essential steps in developing a training program and the basic questions that should be asked at each step. Not surprisingly, these six steps correspond with the six-stage training evaluation model.

### 2.2 Steps of a Training Program

In the water and sanitation sector, training activities vary widely, from traditional technical training for a conventional water and sewer agency to instruction in community outreach techniques for staff who will assist efforts to improve rural sanitation. Support areas, such as bookkeeping and basic financial management, may also need to be addressed in training programs, particularly those targeted at local communities.

All training activities are intended to benefit the participating individuals as well as the organization with whom the individuals work. Training participants may need the *skills* to design, construct, maintain, and repair water supply and sanitation systems; they may need the *knowledge* of appropriate types of materials or equipment or they may need the *attitudes* necessary to successfully involve others. In general, the acquisition of new skills, knowledge, or attitudes (SKA) is addressed through some form of training or retraining, the results of which may be evaluated accordingly.

The basic flow of a training program is as follows:



First, SKA needs are identified. Then, training is conducted to address these identified needs. Finally, participants apply their new skills, knowledge, and attitudes back in the workplace, which should result in improved organizational performance.

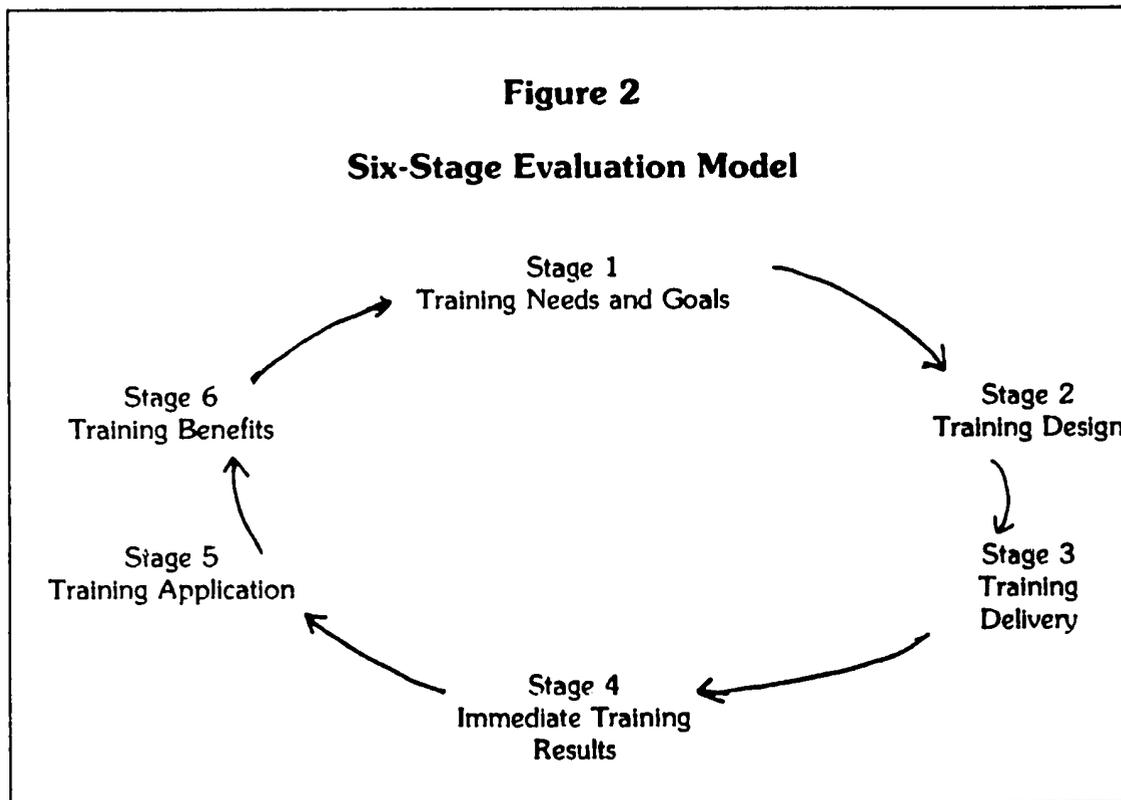
This basic flow can be created by following six steps, which, along with basic questions to ask at each step, appear in Figure 1.

**Figure 1**  
**Six Steps of Training**

<b>Steps</b>	<b>Key Questions</b>
1. Training Needs Assessment	<ul style="list-style-type: none"> <li>• Is training the best way to address an identified need?</li> <li>• What organizational benefits could training produce?</li> <li>• Who should receive training?</li> <li>• What SKAs are needed?</li> </ul>
2. Training Design	<ul style="list-style-type: none"> <li>• What approach is most appropriate?</li> <li>• How can a design be created?</li> <li>• Who should do this?</li> </ul>
3. Training Delivery	<ul style="list-style-type: none"> <li>• What is going well/not well?</li> <li>• Are the program goals being achieved?</li> <li>• What problems are occurring?</li> <li>• What modifications are needed?</li> </ul>
4. Immediate Training Results	<ul style="list-style-type: none"> <li>• What SKAs were acquired?</li> <li>• What else was learned?</li> <li>• How can new SKAs be applied?</li> </ul>
5. Training Application	<ul style="list-style-type: none"> <li>• How effectively are SKAs being used, and why?</li> <li>• Which SKAs are not being used?</li> <li>• Who is using the new SKAs?</li> </ul>
6. Training Benefits	<ul style="list-style-type: none"> <li>• What benefits are occurring? Not occurring?</li> <li>• What problems are occurring due to use/nonuse of the new SKAs?</li> </ul>

## 2.3 Six-Stage Model for Training Evaluation

These guidelines introduce a six-stage evaluation model that essentially follows the six training steps in Figure 1. This evaluation model (Figure 2) will be presented and discussed throughout the guidelines as the cyclical process shown in the following diagram.



**Stage 1. Training Needs and Goals**, asks a basic question: Did a need for training exist? This stage assesses whether there was a problem or opportunity for which training could make a worthwhile difference.

**Stage 2, Training Design**, examines the quality and suitability of the training design itself. Stage 2 evaluation asks questions about training goals, session objectives, procedures, and methodology, as well as about the program's designers and trainers. Moreover, it identifies the missing pieces: What elements would have made the program more appropriate?

**Stage 3, Training Delivery**, evaluates whether the training was (or is being) properly implemented. It identifies delivery and logistics problems, and determines any needed adjustments. This stage may occur weekly, at midpoint, or at the end of the program.

**Stage 4, Immediate Training Results**, takes place at the conclusion of the training event. It measures the changes in participant skills, knowledge, or attitudes against the objectives that were set for the program. However, Stage 4 evaluation is still within the context of the training program.

**Stage 5, Training Application**, takes the measurement of skills to the workplace, evaluating if and how the acquired skills are being applied on the job.

**Stage 6, Training Benefits**, assesses the benefits from a training activity—to the participant, to the organization, and to the community. Once the benefits are identified, their value is estimated and compared with the costs of the training.

The stages are represented as a cyclical process because each stage builds upon the previous stages. This is not to say that evaluations need to be carried out at each stage or that a Stage 5 evaluation, for example, requires that evaluations first be carried out for the previous four stages. What it does suggest, however, is that evaluators will likely need to ask questions related to earlier stages in order to draw the right conclusions for the stage they are evaluating.

Although the guidelines focus on stages 5 and 6, key elements of the first four stages are reviewed in Chapter 4: those stages provide the essential framework for stages 5 and 6.<sup>1</sup>

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<sup>1</sup> The evaluation approach presented in this chapter is influenced by Robert O. Brinkerhoff's *Achieving Results from Training: How to Evaluate Human Resources Development Programs and Increase Impact*, Jossey Bass Publishers, 1987.

## Chapter 3

# PLANNING THE EVALUATION

### 3.1 Introduction

This chapter provides suggestions on planning and organizing a training evaluation. The chapter begins with a discussion of the evaluation process itself—what is to be evaluated and who is the audience. It next looks at the evaluation design—developing appropriate questions, and collecting and analyzing data. This section is followed by guidelines for the final report and for managing the overall evaluation. The chapter concludes with a discussion of two key factors to consider when organizing an evaluation: team composition and evaluation time frame.

### 3.2 Evaluation Purpose

Many aspects of a training program can be evaluated. For example, an evaluation can study the effectiveness of a specific phase in the training program, such as the needs assessment, or it may focus on specific elements of the program, such as the adequacy of the training materials or the trainers' competence. An evaluation may also be concerned with broader policy issues, such as the benefits of the program to the organization. Each of these evaluations would require a different approach; thus, a clear decision on *what* is to be evaluated is fundamental to success.

#### 3.2.1 Determining What to Evaluate

It is not always necessary or appropriate to undertake all six stages of the training evaluation process.

A training activity may be too new to evaluate application and benefits (stages 5 and 6); the organization may be interested only in finding out if participants are learning what it was hoped they would learn (i.e., Stage 4). The program's impact on organizational performance may be the subject of a more-comprehensive and quite separate evaluation at a later date.

In another case, a well-established training program may need only to evaluate whether each successive group of trainees had mastered the SKAs with which the program was concerned (i.e., Stage 4), especially if the organization has already shown itself able to use trained staff effectively.

A third example would be whether to proceed to stages 5 and 6 if it is determined that the earlier stages were not done well. In general, it is recommended to look at stages 5 and 6 even if previous stages were problematic, since benefits may have occurred in spite of the training quality. In some cases, however, stages 1-4 may have been so poorly done that it is impossible to proceed to stages 5 and 6. Whether or not to do so would be determined by the evaluators.

### **3.2.2 Identifying the Audience**

Identifying the audience runs parallel with deciding what aspects of the training program are to be evaluated. *Who* the audience will be depends to a large extent on the underlying reasons *why* the evaluation has been ordered in the first place. If the trainers are the intended audience, they will probably be most interested in an evaluation of the delivery and effectiveness of the program itself. If, on the other hand, the intended audience is senior decision-makers, they will likely be interested in the impact of the program on the organization and its overall cost and benefits. Decisions about what to evaluate, why, and for whom determine much of *how* the evaluation should be undertaken: its design, its cost, and the composition of the team.

## **3.3 Evaluation Design**

The evaluation team will need to decide on the questions it wants to ask and the plan of inquiry it wants to follow. These questions and the plan of inquiry make up the evaluation design.

### **3.3.1 Developing Evaluation Questions**

The questions to be asked should be derived directly from the evaluation purpose. Moreover, to the extent possible, they should be developed in collaboration with the intended audience. Evaluation questions should be broad and open ended, primarily to enable wide-ranging responses. Responses to broad questions will often reveal things that were unexpected and that require follow-up questions to obtain a full picture. Some responses may also suggest that different questions be asked in future interviews to determine if others see the issue the same way.

### **3.3.2 Collecting and Analyzing Data**

The way in which the data is collected and analyzed will depend almost entirely on the scope of the study and the resources available to the evaluators. At one extreme, there may be careful sample selection, extensive interviewer training, pretesting of questionnaires to eliminate bias, and computer analysis with sophisticated statistical techniques. At the other extreme, all participants in a training course may be asked the same set of simple questions, with the results tabulated manually by a single evaluator.

It is beyond the scope of these guidelines to provide generally applicable guidance on all potential methods for collecting and analyzing evaluation data. But it is essential that—

- The data is collected systematically.
- Adequate precautions are taken against interviewer and respondent bias or misunderstanding.

- Where sampling is used, it is based on sound sampling procedures.
- The data analysis process is also systematic and consistent.

### **3.4 Reporting the Findings**

One outcome of initial discussions with the key clients should be a shared understanding of what the final evaluation report will look like and what the clients can expect to learn from the report's findings, conclusions, and recommendations.

To help reach agreement on the final report, it is suggested that the evaluation team use a draft or sample table of contents as a basis for the discussion (see Figure 3). By working through each of the headings in appropriate detail, the specific needs and expectations of the clients should become clearer. As a result, the evaluation design can be adjusted to place more or less emphasis on each of the stages or on particular elements within one or more stages.

As a part of reaching agreement on the expected product, the clients should be encouraged to draft a plan showing how they intend to use the results. At this point, they may only be able to decide who will have major responsibility for following up on specific recommendations from the evaluation. However, any additional information that provides guidance to the evaluation team is helpful. For example, indications of upper budget limits for future training activities will help the evaluators develop recommendations that are generally feasible.

**Figure 3**  
**Sample Evaluation Report**

**TABLE OF CONTENTS**

**Executive Summary**

Summary of major findings, conclusions, and recommendations.

**Introduction**

Evaluation purpose and relevant project, sector, and country information.

**Analysis of Training Needs Assessment**

See Stage 1.

**Analysis of the Training Program Design**

See Stage 2.

**Analysis of Implementation**

See Stage 3.

**Analysis of Immediate Results**

See Stage 4.

**Analysis of Individual Job Performance Changes**

See Stage 5.

**Analysis of Organizational and Individual Benefits**

See Stage 6.

**Major Findings, Conclusions, and Recommendations**

### **3.5 Managing the Evaluation**

Whatever type of evaluation is undertaken, it represents an expenditure of the organization's time, effort, and money. And, because an evaluation inevitably results in some disruption of normal operations, it is important that it be managed efficiently and that its findings be utilized.

One individual within the organization should have overall responsibility for managing the evaluation process and should monitor the following:

- Adequacy of the evaluation design
- Efficient implementation of the evaluation design
- Achievement of immediate objectives of the evaluation
- Application of evaluation results, and by whom
- Achievement of evaluation purpose

For a major evaluation, this person may need authority to commit resources to the work and to communicate to organizational units what collaboration is expected. He or she would also be expected to report to senior management on evaluation findings and recommendations, and on the steps that are needed or are already being put into effect in order to respond.

### **3.6 Organizing the Evaluation**

Two key factors must be considered when organizing the evaluation: team composition and evaluation time frame.

#### **3.6.1 Team Composition**

A team approach to training evaluation is recommended, since it blends skills, facilitates collaboration, and enables the evaluation to be done within a reasonable period of time. The team may include as few as two people; the important factor is that it be multidisciplinary.

At least one individual should have a strong technical background in the area being evaluated, with an ability to present the team's findings in technical terms. Another team member should have a strong training background, with experience in training design, delivery, and evaluation. All team members should have experience in developing countries.

A key question to consider in selecting team members is whether they should come from within the organization or from outside. The following are some advantages and disadvantages of internal versus external teams:

## **External Team**

### **Advantages**

- *Objectivity.* Unlikely to be swayed by political considerations and usually unafraid of retaliation (that is, if findings do not reflect well on certain staff).
- *Broad experience.* Bring experience gained in other projects to bear on the evaluation.

### **Disadvantages**

- *Cost.* Inevitably more expensive.
- *Unfamiliarity with the organization.* May have trouble understanding the intricacies of a particular organization.
- *Availability.* Often available for only a short period of time.

## **Internal Team**

### **Advantages**

- *Familiarity with the organization.* Knows the organization's objectives, procedures, and problems.
- *Flexible time frame.* Can spread the evaluation over whatever time frame is required (that is, no pressure imposed by team's impending departure).
- *Reinforces self-examination.* Encourages the principle of self-examination and evaluation and builds internal competence for this purpose.

### **Disadvantages**

- *Lack of objectivity.* May have trouble taking an independent view (that is, may need to be critical of their own organization and of their own managers).
- *Lack of experience.* May have had insufficiently broad experience (outside the organization) to be able to explore a full range of alternative solutions.

"External" should not necessarily mean "expatriate" when determining team composition. The use of personnel from other in-country institutions should always be explored, as long as they would be under no obligation to make reports to their own management.

Once the team is formed, an effective working relationship will need to be established with the appropriate client personnel—those who are, and will be, responsible for training design, implementation, and evaluation. It is also vital that the team gain the respect and confidence of the management of the organization whose programs are being evaluated, or there is little chance that difficult recommendations will be acted upon.

To establish effective working relationships, the team must be client-centered and must use a collaborative consulting approach throughout its assignment.

### **3.6.2 Evaluation Time Frame**

The size of the evaluation team and the period of time it requires will vary widely, depending on the complexity of the program or activity that is to be evaluated, the specific stages to be examined, and the client's expectations of the evaluation.

Figure 4 suggests time frames for each evaluation stage.

**Figure 4**

**Evaluation Time Frame**

	<b>Stage</b>	<b>Time Frame</b>
1.	Needs and Goals Analysis	6 person-days
2.	Design Analysis	3 person-days
3.	Implementation Analysis	3 person-days
4.	Results Analysis	6 person-days
5.	Job Performance Analysis	8 person-days
6.	Benefits Analysis	8 person-days
	Report Preparation	4 person-days
	Final Discussions	2 person-days

Of course, these time requirements can vary considerably if background material on strategy development and needs assessment—for whatever reason—is unavailable.

Even though the scope of work may not call for an evaluation of all stages, it is useful to at least consider every stage in general terms. In so doing, the evaluators have an overall framework for the evaluation, and their final evaluation report can provide an overview of the complete training process.

## Chapter 4

# EVALUATION STAGES 1 THROUGH 4

### 4.1 Introduction

This chapter provides an overview of the first four stages of the training evaluation model introduced in Chapter 2. These stages examine—

- Training Needs and Goals.
- Training Design.
- Training Delivery.
- Immediate Training Results.

### 4.2 Stage 1: Training Needs and Goals

At Stage 1, the evaluators try to determine if training was the best response to the specific identified need, problem, or opportunity. Typical questions for a Stage 1 evaluation include the following:

- How clearly stated were the training program goals and expected results? How were these goals and outcomes decided upon?
- Was there a good analysis of the constraints and the overall sectoral context (for example, salaries, staff turnover, equipment, changes in administration) before determining the training goals?
- Was training the most cost-effective solution?
- Were key groups—project, community, others—taken into account in the training needs assessment? Were roles and needs discussed and agreed upon?
- Was top management consulted in any final decisions? Were the managers committed to the training program?
- Was the proposed training appropriate to the users' needs and anticipated capabilities?
- Was a realistic assessment made of the available resources (for example, funding, time, specialists)?

- Were appropriate indicators<sup>2</sup> developed for measuring the success of the training program?

In sum, the purpose of Stage 1 is to determine whether the original training needs analysis was complete and accurate—to examine whether the ways in which answers were obtained to the questions were appropriate and whether the training efforts designed to remedy identified needs were on target.

### 4.3 Stage 2: Training Design

Stage 2 of the six-stage evaluation model evaluates whether the training was well-designed and also whether the people or organization selected to carry out the work were appropriate.

The evaluators

should examine the ways in which the original training plan approached the problem by asking questions such as these:

- What were the strengths and weaknesses of the training plan that was adopted?
- Did the training plan identify goals and specific objectives?
- Were the goals and specific objectives appropriate to the needs and anticipated capabilities of the intended participants?
- Were indicators of required job performance (which should have been identified in the training needs assessment) linked to the specific objectives?
- What were the selection criteria for the participants?
- Was the training approach that was developed (for example, periodic on-the-job training versus a three-day residential course) the best one to achieve the desired results?
- What was the selection criteria for the trainers?
- Were the training methods appropriate for the participants?
  - Adult learning methods (case studies, small-group work, demonstrations, and role playing)
  - On-the-job training
  - Job aids
  - Individualized instruction

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<sup>2</sup> The term *indicator* is used in this document to refer to an "active measurement" of performance (see 5.5).

- Were local personnel resources and know-how sufficiently taken into account?
- Would it have been more efficient to adapt existing training programs where they existed, or would it have been more efficient to design a "tailor made" program? Was the actual decision correct?
- Were any activities planned to support the trainees after completion of the training (e.g., follow-up sessions)?

Note that none of these questions asks whether the training needs were correctly assessed, since that was determined in Stage 1. They ask whether the designers, faced with the decision to proceed with training, made the best possible plan in light of the information available at that time.

#### **4.4 Stage 3: Training Delivery**

At Stage 3, evaluators examine training implementation to determine whether training activities were executed in a way that allowed the participants to obtain the intended benefits.

A Stage 3 evaluation can be carried out at midpoint in the training program as a way to identify any adjustments or corrections that may be needed, or it may be undertaken afterward, to provide guidance for future training. Questions that should be asked in this stage include the following:

- Did the training provided follow the agreed-upon design?
- Were the participants selected correctly? Were they at the appropriate level of responsibility? Did they have the basic skills needed to benefit fully from the course?
- Were the instructor and participant training materials satisfactory? Were they in the right language? In a readable format? Were there enough copies?
- Were the instructors skillful trainers? Were the training techniques appropriate?
- How feasible was the adopted training strategy in practice?
- Was the training site appropriate? Did participants have any difficulty reaching the site? Was the site appropriate for field trips?

There are numerous tools and techniques that can be used to implement a Stage 3 evaluation: interviews, direct observation, questionnaires, and training documents such as individual participant reports, training manuals, and trainer reports.

#### **4.5 Stage 4: Immediate Training Results**

At stage 4, evaluators assess the immediate results of the training program, primarily by measuring the changes in skills, knowledge, or attitudes against the objectives that were set for the program.

The primary purpose of training is to produce change in participant performance, and stage 4 is the first opportunity to determine the extent to which these changes have actually occurred. This evaluation stage generally takes place at the end of the training program.

The guiding question for Stage 4 evaluation is this: Did the training program accomplish its intended outcomes? From a training evaluation perspective, Stage 4 should enable the training manager to decide the following:

- Is more training needed?
- What should be the focus of additional training?
- Should modifications be made in the training design or curriculum?
- Is a Stage 5 evaluation feasible? (How well are the newly acquired skills being applied in the workplace?)

If, for example, the Stage 4 data show that pump operators are still unable to carry out basic operation and maintenance tasks for a diesel engine, there may be a need both to revise the training design and to retrain the operators in these basic tasks.

Numerous techniques and tools can be used in Stage 4, many of them similar to those suggested for Stage 3. These are included in Figure 5.

Usually, Stage 4 evaluations reveal that some learning outcomes were achieved and others were not. Moreover, in many cases there are individual differences in the degree of learning. For these and other reasons, it is important at Stage 4 to identify and differentiate among the varied accomplishments of the training program's objectives, so that good use can be made of these results—both to improve future programs and to plan for retraining (or perhaps releasing) those individuals who did not acquire the expected skills.

## Figure 5

### Techniques and Tools for Stage 4 Evaluation

**Pre/Post-Tests.** Designed to measure participants' skills prior to and at the end of the training program.

**Interviews.** Designed to bring out participants' responses to the training.

**Knowledge Tests.** Designed to measure the acquisition of knowledge.

**Achievement Tests.** Designed to measure the acquisition of skills.

**Simulations.** Designed to measure how well SKAs are applied in a simulated setting or through role-playing.

**Self-Assessment and Reports.** Designed to document participant and trainer assessments of their performance, of each other, and/or of the training program itself.

## Chapter 5

### STAGE 5 EVALUATION: TRAINING APPLICATION

#### 5.1 Introduction

This chapter focuses on Stage 5, Training Application, and aims at helping the evaluator determine the extent to which acquired skills are being transferred to the job. The chapter begins with a brief definition of Stage 5 evaluation and a discussion of its uses; then identifies sources of data for establishing a baseline to evaluate pre- and post-training behavior. This section is followed by a discussion on how to develop indicators for skill application. The final section of the chapter identifies some of the techniques for carrying out a Stage 5 evaluation.

#### 5.2 Stage 5: Job Performance

At stage 5, evaluators assess the extent to which acquired skills are being transferred to the job. This stage cannot begin until Stage 4 evaluation indicates that the immediate learning objectives were achieved at the end of the training program. Preconditions for Stage 5 evaluation are that the participants completed training and learned something worth following up on.

The domain of Stage 5 is usually the workplace; it is never the training program itself. Stage 5 is concerned with what happened as a *result* of the training, not with whether the training program achieved its immediate learning objectives. Stage 5 looks at *actual job performance*, not at whether learning occurred during the training program.

#### 5.3 Uses of Stage 5 Evaluation

There are two principal uses for the Stage V evaluation:

- To evaluate the transfer to the workplace of what was learned and any resultant change in performance
- To assist in the planning of additional organizational interventions that alter the way the agency or project is being managed

The first use gives information needed to decide upon any revisions to the training program or to determine what nontraining interventions may be needed to support the training that has taken place. For example, suppose that engineers are trained to design projects by computer. However, when they return to their jobs, they have no access to computers. A Stage 5 evaluation might show that the training was well done but that the computers were unavailable. This would point to the need to either redesign the training to use available

methods or to procure computers. In such a case, the second use of the Stage 5 evaluation would be illustrated if the latter solution, one that is managerial, were arrived at: to procure computers so that when the engineers return to their jobs, they have access to computers.

## **5.4 Baseline for Stage 5 Evaluation**

The fundamental document guiding the direction of Stage 5 evaluation is usually the training needs assessment, which identifies a specific problem or set of problems the training program was designed to address. If the needs assessment was properly done, data should exist that demonstrate the training need(s). It is these data that serve as a baseline for the Stage 5 evaluation and enable comparisons of pre-training with post-training behavior. But the training design that results from the needs assessment includes other information that should be considered—for example, what performance indicators are linked to specific objectives. (See Stage 2 questions highlighted in 4.3.)

The key questions below also need to be addressed as part of the Stage 5 evaluation:

- What new or improved skills are the participants demonstrating on the job following the training program? (**What**)
- In what contexts and how frequently are the specific skills being demonstrated? (**When**)
- What changes in the participants' performance are the application of these skills making after the training program? What indicators are used to denote these differences? (**How**)
- Who is monitoring the application of the skills on the job, at what specific times, and how frequently? (**Who**)

## **5.5 Indicators of Skill Application**

Training programs in the water supply and sanitation sector are usually directed at technical or management improvement. Stage 5 evaluation, whether for technical or management training activities, requires clear indicators to determine whether the skills are being applied in the workplace. If these indicators were not identified as an outcome of the training needs assessment, and if they are not clearly stated in the specific objectives of the training design, the evaluators will need to develop indicators before they can proceed with the Stage 5 evaluation.

### **5.5.1 Definition of Indicator**

The term *indicator* is used in this document to refer to an "active measurement" of skill application. Indicators are linked to job performance. For example, a graduate of a training

program in handpump maintenance who has responsibility for providing backup maintenance to several communities should be able to perform all major repairs. Assuming he has the right tools and spare parts and the means to get to the communities, the pumps he repairs should not break down again for the same reason. The indicator of not having repeat problems can be developed and looked at by the evaluators.

Training objectives should point clearly to job performance indicators identified (ideally) during the training needs assessment and training design process.

### **5.5.2 Indicators for Technical Tasks**

Indicators for most technical tasks can be readily developed. However, care must be taken in the evaluation process to ensure that any indicators developed are linked to the training program objectives and not to other issues.

The following example illustrates how technical indicators are established.

#### **Indicators of Technical Skill Application**

Suppose that routine analysis of water quality in a piped system produced an unacceptable number of "false positives" (i.e., contamination). After tests proved negative in a control laboratory, it was determined that the technicians' poor hygiene during sampling and subsequent testing was causing the contaminated samples.

Following a training course at a properly equipped laboratory, the Stage 5 indicators of performance might be set up as follows:

- All trained technicians should know how to take samples properly, protect them from accidental contamination, test them, and report the results accurately. **(What)**
- Tests should be conducted at various points throughout the system at least \_\_\_ times each week. **(When)**
- The sample results should reduce the number of false positives to no more than \_\_\_ percent. **(Who)**
- The quality of sampling will be checked by analyzing control samples taken by the central laboratory staff, initially at the same points as the technicians and later at key indicator points throughout the system.

### **5.5.3 Indicators for Management Tasks**

Indicators for management tasks are not as easily developed as those for technical tasks, since improving management style usually involves changing skills and attitudes, rather than adding knowledge, and attitudes are more difficult to evaluate than skills and knowledge. Thus, evaluating training programs aimed at improving management style can be more complicated. In these cases, improvements in managerial performance due to training can be assessed by interviewing subordinates, asking such questions as the following:

- Do you clearly understand what the organization's overall objectives are?
- Do you understand your own role and your unit's role in helping to achieve these objectives?
- Does your manager provide adequate direction?
- Is your manager open to suggestions on how to improve operations?
- How are decisions made?
- Do you have a clear picture of potential career opportunities within the organization?
  - Are you getting the training you need in order to progress in your career?
  - Are you confident that personnel selection procedures are sufficiently unbiased to afford you an equal opportunity in promotions?
- Does your manager monitor your work and provide appropriate feedback?

Because managerial activities are so broad, the effects of attitude changes may be perceptible only over time, and then through indirect indices—regular measurement of staff job satisfaction, staff productivity, and staff turnover, for example.

### **5.6 Techniques for Stage 5 Evaluation**

Because Stage 5 evaluation is concerned with on-the-job application, it is important that data gathering be as close to the job level as possible. Prime sources of information will be customers or users, participants and their immediate supervisors, and people who are affected by the participants' on-the-job performance (such as consumers), and also hard information (such as average number of vouchers processed in a day). Higher-level staff may have useful perspectives on the overall training value, but are not usually as aware of the de-

tails of its strengths and weaknesses when applied to real problems. The most useful tools for collecting the necessary information are questionnaires, interviews, and direct observation.

If a training program has been extensive, a suitable sample of trainees and their supervisors should be used, or the exercise will be too costly and time consuming. Whatever technique is used, it is important to prepare beforehand a statement of the behavior that was expected as a result of the training, so the evaluators know precisely what they are looking for.

Observation of on-the-job performance is valuable but tends to be obtrusive. This in turn often results in nontypical behavior (and possible resentment) if the trainees feel they are being watched. The problem can be overcome by placing more emphasis on reviewing trainees' work products than on observing them at work.

Existing data very often provide valuable insights into how much transfer to the workplace has taken place. Routine documentation such as reports, work schedules, production records, expense and reimbursement forms, logs and diaries, and repair and maintenance records should be readily available. This data will allow the evaluator to form an initial impression, identify likely areas requiring special attention, and develop a strategy for completing the evaluation in the most-efficient and least-disruptive manner.

## Chapter 6

### STAGE 6 EVALUATION: TRAINING BENEFITS

#### 6.1 Introduction

This chapter provides guidance on how to identify and measure the benefits of training. Following a brief definition of Stage 6 evaluation, the chapter discusses three categories of potential training benefits: direct benefits to the participants, benefits to the organization, and benefits to the users. The final section of the chapter identifies some problems that arise in trying to give monetary values to benefits.

#### 6.2 Why Benefits Should Be Assessed

The main purpose of Stage 6 evaluation is to assess the benefits from a training activity, estimate their value, and compare this value with the training costs. Four basic questions need to be answered in Stage 6:

- What were the benefits to the participant? To the organization? To the user?
- What is the value of these benefits to the participant? To the organization? To the user?
- How do these benefits compare with the cost of the training activity?
- Has the problem(s) identified in Stage 1 been resolved?

Benefits should be expressed in monetary terms whenever possible, so that they can be directly compared with the training costs. However, as discussed later in this chapter, some benefits can only be estimated in subjective terms; in general, the cost:benefit ratio of most training programs is a matter of judgment rather than of direct calculation.

Evaluation of the overall benefits of the training activities (Stage 6) will help the organization answer two questions:

- Was training the appropriate response to the original problem?
- Was the training program itself appropriate? (Assuming that the participants applied what they learned in the training activity.)

If the skills are being applied but no improvements are visible, the implications are that either the training itself was faulty or the organizational problems are of a type that cannot be solved by training alone (e.g., policy changes may be needed at senior management level).

### 6.3 Benefits to the Training Participant

The most immediate benefits from participation in a training program are to the individuals concerned and may take several forms:

- Improved job performance
- Better self-image
- Greater job satisfaction
- Enhanced career opportunities

These benefits can be quantified by salary increases or promotions that result from successfully completing the training program and by new skill application on the job. Qualitative benefits, such as better job satisfaction, may be hard to express in quantitative terms but are nonetheless important. These benefits are helpful to the organization as well: increasing employees' productivity and abilities helps to improve the organization's capability; increasing their job satisfaction helps to reduce turnover and absenteeism.

However, two benefits to the individual do not benefit the organization:

- ***New employment opportunities.*** Newly acquired skills may enable employees to obtain new positions outside the organization. This "brain drain" seriously weakens many government agencies in developing countries, but is important to the overall economy.
- ***Moonlighting.*** Some staff may also be able to attract employment outside normal working hours. No harm is done as long as these outside activities do not interfere with the employees' primary job responsibilities. On the contrary, this practice ensures that good craftsmanship or valuable skills become more widely available.

These two benefits should be either excluded from the cost/benefit formula or included as a net cost.

### 6.4 Benefits to the Organization

Because training is undertaken by sector organizations to help achieve their objectives, the most important measure of training success is whether measurable improvements have occurred in the organization's effectiveness and achievements.

### **6.4.1 Training to Address Specific Problems**

Very often training programs are undertaken to address specific problems within an organization. Programs of this sort will usually have their own measures of success, and these can frequently be quantified. Here are a few specific examples:

1. Has the level of accounts receivable been reduced to fewer than \_\_\_\_ month's billings as a result of upgrading the skills of the accounts staff and introducing better tracking procedures?

*Quantifiable measure of success:* Lower debt-servicing costs on working capital.

2. Has the level of unaccounted-for water been reduced to \_\_\_\_ percent of the total water supply, following training in leak detection and repair?

*Quantifiable measure of success:* Increased water sales.

3. Has the skill upgrading of the meter shop staff reduced water-meter failures to a level not exceeding \_\_\_\_ percent of the total?

*Quantifiable measures of success:* Increased water billing and lower meter-repair costs.

If training has been properly delivered in examples such as these, but organizational results are still unsatisfactory, the remedy probably lies in other solutions such as management and planning practices. Even well-trained leak detection units cannot be expected to have much impact if there are too few of them. Similarly, accounts staff cannot send bills on time if power failures jeopardize computer operations.

### **6.4.2 Training to Upgrade Overall Institutional Performance**

Training is also undertaken to upgrade an organization's overall institutional performance, and these programs are much more comprehensive in scope. An example follows.

## **Improving Overall Institutional Performance**

### **An Example from the Philippines**

The Local Water Utilities Administration (LWUA) in the Philippines acts almost as a development bank in assisting local independent water districts. It helps them through a progressive institutional development program, one that considers 64 key performance areas.

The program begins with a training needs assessment, followed by training to address specific needs. When water district management adopts a new approach or policy, a further needs assessment will indicate the skill upgrading needed in order to put the decision into effect. The process is long term and intensive, lasting typically about seven years.

Although each element within the program can be evaluated, the overall institutional benefits emerge slowly; successive evaluation of individual elements underestimates total benefits because it ignores the intended synergistic effects of the overall development process.

When evaluating institutional benefits, many types of variables should be considered: increased outputs, improved quality of service, greater user satisfaction, reduced staff turnover, and lower unit costs. It is important that the list of variables be sufficiently broad, not only to ensure that the original stated training objectives are covered but also to ensure that unintended outcomes are identified.

#### **6.4.3 When Organizational Benefits Are Fewer than Expected**

If institutional benefits are fewer than expected, the evaluators should try to understand the underlying causes of any problems. Lower benefits may be due to errors in the original problem identification or to faults in training design or delivery. They may also be due to lack of commitment on the part of a few influential staff within the organization. Or, it may simply be that one element of institutional development could not keep pace with the others, as the following example illustrates.

## When Benefits Are Less Than Expected

### An Example from Africa

In a well-drilling program in Africa, training concentrated on the establishment of local units for construction and maintenance. The construction program was very successful, but for a variety of reasons the organization's logistical support to the maintenance units could not keep pace with the program's expansion. By the time this problem was identified, it was too late to redesign the program approach to one that trained communities to take over maintenance.

## 6.5 Benefits to the User

From the user's perspective, the overriding benefit of training activities is their contribution to the extension of affordable and sustainable water system and sanitation services. Some examples of direct benefits to users follow.

**Handpump maintenance.** In one case, a government agency had responsibility for handpump maintenance in rural areas, and repairs took months; during this time, villagers reverted to traditional unsafe, unreliable, and inconvenient sources of water. When villagers were trained to service a less-sophisticated (and less-reliable) handpump, the number of breakdowns per year increased considerably—but the pumps were usually back in service the same day.

**Managing user fees.** Villagers resettled away from an area of civil disorder had great difficulty in making the substantial monthly payments for their electricity and water supply service. With some training on how to manage financial affairs, they were able to change to a system of weekly collection by the community itself; this made the payments more manageable, and they could also be collected at hours convenient to the people concerned.

**Skill availability.** Small-scale contractors trained to build VIP latrines on the government sanitation project worked after hours building latrines for individual homes, enabling people to improve their living conditions without waiting for government help.

**Alternative systems.** When it proved hydrogeologically impossible to install handpumps in villages, the district-level technicians and extension workers of the sector collaborating agencies were retrained in other types of water supply systems. In this way, they were able to introduce rainwater harvesting and spring protection in the area.

**Community participation.** Agency technicians were unaccustomed to asking the community what facilities they preferred. Although water points were provided, there were problems with use, maintenance, and repayments. When the technicians were trained to

consult with the communities about what should be provided, they learned that it was essential to allow for watering animals and for washing wool and hides. When these additional aspects were incorporated into the project, the earlier problems were greatly reduced.

The last two examples illustrate that an important training objective may be to broaden the approaches used by the organization, in order to improve the service coverage provided and to ensure that systems are affordable and sustainable. The following are examples of these broader approaches:

- Plans for water supply and sanitation systems that incorporate a broader mixture of technologies—to ensure that all groups within the population can be reached
- Agency procedures modified to include steps to ensure that any projects undertaken are socioculturally appropriate, as well as technically sound
- More-flexible institutional designs of projects, to encourage involvement of the communities affected and of NGOs
- Cost-recovery mechanisms redesigned to take greater account of affordability (including the timing, level, and nature of payments or contributions)
- Operation and maintenance procedures amended to allow greater scope for community-level inputs

User benefits can be expressed as direct cost savings—when training helps introduce new, simpler, and less-expensive technologies that had not formerly been considered—as well as increased reliability and extended access to service. These factors can be quantified, if necessary, in order to attribute monetary values to the benefits (e.g., by using specialized techniques such as contingent valuation or hedonic analysis).

In addition, better access to service may lead to other benefits, such as improved health and productivity, nutritional status, and educational ability. Quantifying these benefits presents a number of methodological problems, but the fact that they cannot always be measured readily does not mean that they do not exist. In a Stage 6 evaluation, such user benefits should be determined and, to the extent possible, quantified.

## **6.6 Difficulties in Correlating Training to Benefits**

Much of Stage 6 evaluation seeks to discover whether the training investment was beneficial over the long term. This becomes difficult to assess when the training event or program is one of several ongoing organizational-improvement efforts. In the long term, attention to each of these efforts will build a strong institution; in the short term, however, the impact of each effort will be less than if the other institutional elements were already in place.

In some cases, training benefits can be directly measured and a cost:benefit analysis made. For example, when training a mechanic reduces the time taken to perform routine maintenance by half, the savings in wages can be directly compared to the cost of training. In other cases, however, the benefits of training may be difficult to isolate from those resulting from other interventions. A mechanic, once trained, may receive better tools, a workshop with proper equipment, and better access to spare parts—all of which probably would have been identified as necessary to improve the maintenance program's overall effectiveness. It becomes difficult in this situation to separate the training benefits from the other complementary inputs.

Further research is needed in order to develop an agreed-upon methodology for quantifying the benefits of training and other HRD activities. In the meantime, people who plan training activities should attempt to answer the following questions, beginning with the training needs assessment step:

- What benefits are expected from this training program?
- How can these benefits be quantified?
- How can monetary values be assigned to the quantified benefits?
- What are the estimated costs of the training activities?
- Do the anticipated benefits exceed the estimated costs? If not, what justification is there for proceeding with the training program?

Over time, the responses to these questions will help define a more systematic approach to measuring benefits.

## **6.7 Conclusion**

In most developing countries, training is playing a greater role in the provision and maintenance of water supply and sanitation services. But for many organizations that provide water and sanitation services, training is still a relatively new operational area. Training evaluation is essential to helping such organizations evolve in training experience and expertise.

The evaluation process helps to assure that scarce resources applied to training are effectively addressing priority problems, that problems are correctly defined, that solutions are appropriately identified, and that the intended results are being achieved. Evaluation of training also helps to assure that future programs build on the lessons of past programs. In so doing, training evaluators play a key role: it is not enough for them to critique what has gone before; they should also help organizations look ahead to identify next steps required in improving existing programs and to identify problems that may need to be addressed in future programs.

The evaluation of training has largely been neglected up to now. It is the intent of this document to improve the evaluation process. This effort should be viewed as a first step and as more experience is gained, the document should be reviewed and modified.